

wherein at least one of the terminal continuation oligonucleotide or the first strand synthesis primer comprises a transcriptional promoter sequence;

extending the primer, wherein the extending is carried out with a polymerase such that extension synthesizes a nucleic acid strand comprising the first strand synthesis primer, a complementary sequence of the target nucleic acid strand, and a complement of the terminal continuation oligonucleotide;

incubating the first strand cDNA with a third oligonucleotide under conditions that facilitate hybridization of the third oligonucleotide to the first strand cDNA, said third oligonucleotide being identical or substantially similar to the terminal continuation oligonucleotide;

extending the third oligonucleotide, wherein said extending is carried out with a DNA polymerase such that extension synthesizes a second strand cDNA comprising the sequence of the third oligonucleotide and a complementary sequence of the first strand cDNA;

incubating at least one cDNA strand with a RNA polymerase capable of binding to the transcriptional promoter sequence;

and

transcribing the cDNA strand wherein the transcribing synthesizes a plurality of RNA transcripts.

108. (New) The method of claim 107 wherein the target nucleic acid strand is RNA and the polymerase is reverse-transcriptase, such that the nucleic acid synthesized in the extending step is a first strand cDNA comprising the first strand synthesis primer, a complement of the target nucleic acid strand, and a complement of the terminal continuation oligonucleotide at the 3' end.

109. (New) The method of claim 108 wherein the RNA is mRNA.

110. (New) The method of claim 108 wherein the first strand synthesis primer comprises at least two thymidine residues at its 3' end.

111. (New) The method of claim 108 wherein the first strand synthesis primer comprises a random hexamer sequence of nucleic acid.

112. (New) The method of claim 107 wherein the terminal continuation oligonucleotide comprises at least two nucleotides selected from a group consisting of guanine, deoxyguanine, cytosine or deoxycytosine bases.

113. (New) The method of claim 107 wherein the DNA polymerase is *Taq* polymerase.

114. (New) The method of claim 107, wherein the terminal continuation oligonucleotide comprises a transcriptional promoter sequence and at least one guanine, cytosine, deoxyguanine, or deoxycytosine at the 3' end of the terminal continuation oligonucleotide.

115. (New) The method of claim 107, wherein the first strand synthesis primer comprises a transcriptional promoter sequence.

116. (New) The method of claim 107, where both the first strand synthesis primer and the terminal continuation oligonucleotide comprise transcriptional promoter sequences.

117. (New) The method of claim 107, wherein the RNA transcripts produced are complementary in sequence to the first strand cDNA.

118. (New) The method of claim 107, wherein the RNA transcripts produced are complementary in sequence to the second strand cDNA.

119. (New) The method of claim 107, wherein the RNA transcripts produced are complementary in sequence to both the first and the second strand cDNA.

120. (New) The method of claim 107 wherein the first strand synthesis primer comprises a transcriptional promoter sequence and wherein the terminal continuation oligonucleotide comprises at least one guanine, deoxyguanine, cytosine, or deoxycytosine at its 3' end and a transcriptional promoter sequence different from the transcriptional promoter sequence in the first strand synthesis primer.

121. (New) The method of claim 107 wherein the synthesized cDNA molecules are used as templates for *in vitro* translation.

122. (New) A method of detecting a RNA from a histologically-stained cell, comprising:

- obtaining the cell;
extracting RNA from the cell; and
amplifying the RNA according to the method of claim
107.
123. (New) The method of claim 122, wherein the cell is in a tissue.
124. (New) A method of detecting a RNA from a cell, comprising:
obtaining the cell;
histologically staining the cell;
extracting RNA from the cell; and
amplifying the RNA according to the method of claim
107.
125. (New) The method of claim 124, wherein the cell is in a tissue.
126. (New) The method of claim 125, wherein the tissue is fresh tissue.
127. (New) The method of claim 125, wherein the tissue is frozen tissue.
128. (New) The method of claim 125, wherein the tissue is fixed tissue.
129. (New) The method of claim 128, wherein the tissue is fixed by acetone, aldehyde derivatives, ethanol, or combinations thereof.
130. (New) The method of claim 122 or 124, wherein said cell is from a physiological body fluid, a pathological exudate, or a pathological transudate.
131. (New) The method of claim 130, wherein the physiological body fluid is blood, cerebrospinal fluid, urine, sweat, semen, or saliva.
132. (New) The method of claim 124, wherein the cell is in blood, bone marrow, cerebrospinal fluid, or any other physiological body fluids or any pathological exudates or transudates.
133. (New) The method of claim 122 or 124 wherein said cell is from bone marrow.
134. (New) The method of claim 122 or 124, wherein said cell is from *in vitro* cultured cells.

135. (New) The method of claim 122 or 124, wherein the histological stain identifies cellular structures.

136. (New) The method of claim 135, wherein said cellular structures are mitochondria, centrioles, rough endoplasmic reticulum, smooth endoplasmic reticulum, peroxisomes, endosomes, lysosomes, vesicles, Golgi apparatus, nucleus, cytoplasm, or a combination thereof.

137. (New) The method of claim 123 or 125, wherein the histological stain identifies tissue structures.

138. (New) The method of claim 137, wherein said tissue structures are structures of lamina, matrix, or a combination thereof.

139. (New) The method of claim 122 or 124, wherein the histological stain is Acid black 1, Acid blue 22, Acid blue 93, Acid fuchsin, Acid green, Acid green 1, Acid green 5, Acid magenta, Acid orange 10, Acid red 26, Acid red 29, Acid red 44, Acid red 51, Acid red 66, Acid red 87, Acid red 91, Acid red 92, Acid red 94, Acid red 101, Acid red 103, Acid roseine, Acid rubin, Acid violet 19, Acid yellow 1, Acid yellow 9, Acid yellow 23, Acid yellow 24, Acid yellow 36, Acid yellow 73, Acid yellow S, Acridine orange, Acriflavine, Alcian blue, Alcian yellow, Alcohol soluble eosin, Alizarin, Alizarin blue 2RC, Alizarin carmine, Alizarin cyanin BBS, Alizarol cyanin R, Alizarin red S, Alizarin purpurin, Aluminon, Amido black 10B, Amidoschwarz, Aniline blue WS, Anthracene blue SWR, Auramine O, Azocarmine B, Azocarmine G, Azoic diazo 5, Azoic diazo 48, Azure A, Azure B, Azure C, Basic blue 8, Basic blue 9, Basic blue 12, Basic blue 15, Basic blue 17, Basic blue 20, Basic blue 26, Basic brown 1, Basic fuchsin, Basic green 4, Basic orange 14, Basic red 2, Basic red 5, Basic red 9, Basic violet 2, Basic violet 3, Basic violet 4, Basic violet 10, Basic violet 14, Basic yellow 1, Basic yellow 2, Biebrich scarlet, Bismarck brown Y, Brilliant crystal scarlet 6R, Calcium red, Carmine, Carminic acid, Celestine blue B, China blue, Cochineal, Coelestine blue, Chrome violet CG, Chromotrope 2R, Chromoxane cyanin R, Congo corinth, Congo red, Cotton blue, Cotton red, Croceine scarlet, Crocin, Crystal ponceau 6R, Crystal violet, Dahlia, Diamond green B, Direct blue 14, Direct blue 58, Direct red, Direct red 10, Direct red 28, Direct red 80, Direct yellow 7, Eosin B, Eosin Bluish, Eosin, Eosin Y, Eosin yellowish, Eosinol, Erie garnet B, Eriochrome cyanin R, Erythrosin B, Ethyl eosin, Ethyl green, Ethyl violet, Evans blue, Fast blue B, Fast green FCF, Fast red B, Fast yellow, Fluorescein, Food green 3, Gallein, Gallamine blue, Gallocyanin, Gentian violet,

Haematein, Haematine, Haematoxylin, Helio fast rubin BBL, Helvetia blue, Hematein, Hematine, Hematoxylin, Hoffman's violet, Imperial red, Ingrain blue, Ingrain blue 1, Ingrain yellow 1, INT, Kermes, Kermesic acid, Kernechtrot, Lac, Laccaic acid, Lauth's violet, Light green, Lissamine green SF, Luxol fast blue, Magenta 0, Magenta I, Magenta II, Magenta III, Malachite green, Manchester brown, Martius yellow, Merbromin, Mercurochrome, Metanil yellow, Methylene azure A, Methylene azure B, Methylene azure C, Methylene blue, Methyl blue, Methyl green, Methyl violet, Methyl violet 2B, Methyl violet 10B, Mordant blue 3, Mordant blue 10, Mordant blue 14, Mordant blue 23, Mordant blue 32, Mordant blue 45, Mordant red 3, Mordant red 11, Mordant violet 25, Mordant violet 39 Naphthol blue black, Naphthol green B, Naphthol yellow S, Natural black 1, Natural red, Natural red 3, Natural red 4, Natural red 8, Natural red 16, Natural red 25, Natural red 28, Natural yellow 6, NBT, Neutral red, New fuchsin, Niagara blue 3B, Night blue, Nile blue, Nile blue A, Nile blue oxazone, Nile blue sulphate, Nile red, Nitro BT, Nitro blue tetrazolium, Nuclear fast red, Oil red O, Orange G, Orcein, Pararosanilin, Phloxine B, Picric acid, Ponceau 2R, Ponceau 6R, Ponceau B, Ponceau de Xylidine, Ponceau S, Primula, Purpurin, Pyronin B, Pyronin G, Pyronin Y, Rhodamine B, Rosanilin, Rose bengal, Saffron, Safranin O, Scarlet R, Scarlet red, Scharlach R, Shellac, Sirius red F3B, Solochrome cyanin R, Soluble blue, Solvent black 3, Solvent blue 38, Solvent red 23, Solvent red 24, Solvent red 27, Solvent red 45, Solvent yellow 94, Spirit soluble eosin, Sudan III, Sudan IV, Sudan black B, Sulfur yellow S, Swiss blue, Tartrazine, Thioflavine S, Thioflavine T, Thionin, Toluidine blue, Toluyline red, Tropaeolin G, Trypaflavine, Trypan blue, Uranin, Victoria blue 4R, Victoria blue B, Victoria green B, Water blue I, Water soluble eosin, Xylidine ponceau, or Yellowish eosin.

140. (New) The method of claim 122 or 124, wherein the extracting step further comprises dissection of the cell from the tissue.

141. (New) The method of claim 140, wherein the dissection is from a micropipette on a micromanipulator or by laser capture microdissection.